

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 07 March 2002 (07.03.02)	
International application No. PCT/AU01/01024	Applicant's or agent's file reference 650457
International filing date (day/month/year) 17 August 2001 (17.08.01)	Priority date (day/month/year) 27 April 2001 (27.04.01)
Applicant KALINITCHENKO, Iouri	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
27 November 2001 (27.11.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Evelyne DURAND (Fax 338.87.40) Telephone No.: (41-22) 338.83.38
---	--

PARENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

PHILLIPS ORMONDE & FITZPATRICK
367 Collins Street
Melbourne, Victoria 3000
AUSTRALIE

Date of mailing (day/month/year) 01 April 2002 (01.04.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 650457	
International application No. PCT/AU01/01024	International filing date (day/month/year) 17 August 2001 (17.08.01)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input checked="" type="checkbox"/> the inventor	<input type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address KALINITCHENKO, Iouri 5 Halifax Street Mulgrave, Victoria 3170 Australia	State of Nationality AU	State of Residence AU
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input type="checkbox"/> the name	<input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address	State of Nationality AU	State of Residence AU
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary: The person identified in Box 1 should not be read as applicant and inventor for all States but as a pplicant and inventor for the United States of America only.		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Cécile CHATEL (Fax 338.87.40) Telephone No.: (41-22) 338.83.38
---	---

(19) World Intellectual Property Organization
International Bureau



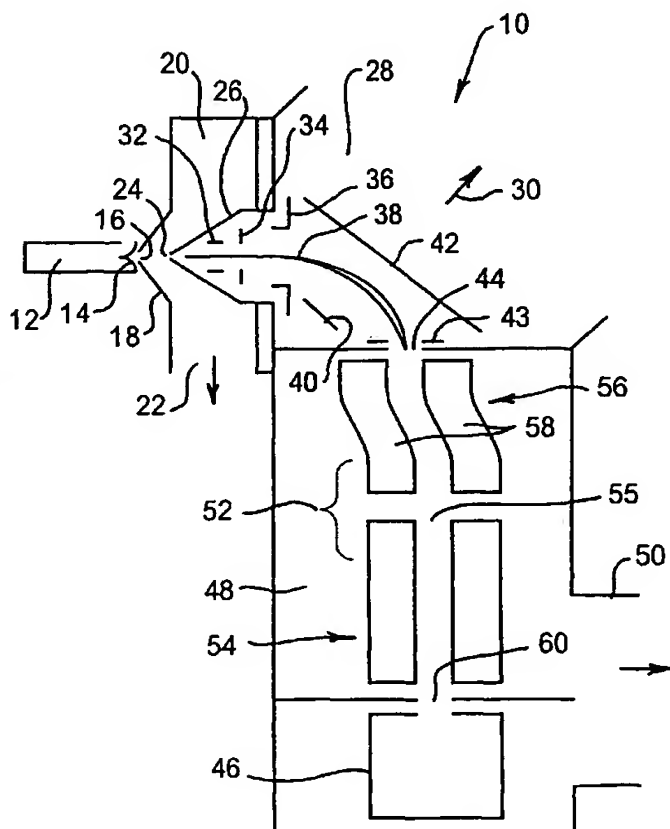
(43) International Publication Date
29 November 2001 (29.11.2001)

PCT

(10) International Publication Number
WO 01/91159 A1

- (51) International Patent Classification⁷: **H01J 49/42** (74) Agent: **PHILLIPS ORMONDE & FITZPATRICK**; 367 Collins Street, Melbourne, Victoria 3000 (AU).
- (21) International Application Number: **PCT/AU01/01024**
- (22) International Filing Date: 17 August 2001 (17.08.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
PR 4651 27 April 2001 (27.04.2001) AU
- (71) Applicant (for all designated States except US): **ARIAN AUSTRALIA PTY LTD** [AU/AU]; 679 Springvale Road, Mulgrave, Victoria 3170 (AU).
- (71) Applicant and
(72) Inventor: **KALINITCHENKO, Iouri** [AU/AU]; 5 Halifax Street, Mulgrave, Victoria 3170 (AU).
- (81) Designated States (*national*): AU, CA, JP, US.
- (84) Designated States (*regional*): European patent (DE, FR, GB).
- Published:**
- with international search report
 - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
 - upon request of the applicant, before the expiration of the time limit referred to in Article 21(2)(a)
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MASS SPECTROMETER INCLUDING A QUADRUPOLE MASS ANALYSER ARRANGEMENT



(57) Abstract: A mass spectrometer (10) having an ion optics system (32, 34, 36, 40, 42) in a first vacuum chamber (28) which diverts ions travelling in a first direction from a source (12, 16, 24) through an angle such that neutral particles and photons from the source continue in the first direction and are removed. The diverted ion beam (38) is then directed into a quadrupole mass analyser arrangement (52) in a second vacuum chamber (48) which comprises a configured, for example curved, set of fringe electrodes (56) followed by a linear mass analyser (54) and then an ion detector (46). The configured fringe electrodes (56) again divert the ions prior to their passage into the linear quadrupole mass analyser (54) whereby additional neutral particles possibly created by passage of the ion beam through residual gas in the vacuum chambers (28, 48) are shielded from entering the linear mass analyser (54). The use of the configured set of fringe electrodes (56) in front of the linear mass analyser (54) has been found to substantially reduce background count rates, particularly for detection of isotopes of low atomic masses.

WO 01/91159 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU01/01024

A. CLASSIFICATION OF SUBJECT MATTERInt. Cl. ⁷: H01J 49/47

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01J 49/IC

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU: IPC AS ABOVE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI and JAPIO} quadrupole; electrode; divert + or
IPC with keywords} deflect + or deviat + or bend + or turn + or direct +**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5939718A (YAMADA et al) 17 August 1999 Abstract, col. 8 lines 16-39, figs 11, 12	1-6, 8, 10, 11-14
X	US 3473020A (BRUBAKER) 14 October 1969 Col. 1, lines 50-72, col. 2, lines 14-18, fig 2	1-5, 8, 10, 11-14
X	EP 0237259A (FINNIGAN CORPORATION) 16 September 1987 Abstract, col. 6, lines 17-36, 54-63, fig 5, 7	1-5, 8, 10, 11-14

☒ Further documents are listed in the continuation of Box C ☒ See patent family annex

* Special categories of cited documents:		"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent but published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 27 September 2001	Date of mailing of the international search report 12 OCT 2001
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer M.E. DIXON Telephone No : (02) 6283 2194

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU01/01024

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3410997A (BRUBAKER) 12 November 1968	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU01/01024

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member	
US	5939718	JP	10097838		
US	3473020	NONE			
EP	237259	CA	1249381	JP	62264546
US	3410997	DE	1598072		
END OF ANNEX					

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

10/089706

Applicant's or agent's file reference IRN 650457	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/AU01/01024	International Filing Date (<i>day/month/year</i>) 17 August 2001	Priority Date (<i>day/month/year</i>) 27 April 2001
International Patent Classification (IPC) or national classification and IPC Int. Cl.⁷ H01J 49/42		
Applicant VARIAN AUSTRALIA PTY LTD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheet(s).
3. This report contains indications relating to the following items:
- | | | |
|------|-------------------------------------|---|
| I | <input checked="" type="checkbox"/> | Basis of the report |
| II | <input type="checkbox"/> | Priority |
| III | <input type="checkbox"/> | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| IV | <input type="checkbox"/> | Lack of unity of invention |
| V | <input checked="" type="checkbox"/> | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| VI | <input type="checkbox"/> | Certain documents cited |
| VII | <input type="checkbox"/> | Certain defects in the international application |
| VIII | <input type="checkbox"/> | Certain observations on the international application |

Date of submission of the demand 27 November 2001	Date of completion of the report 24 January 2002
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer M.E. DIXON Telephone No. (02) 6283 2194

I. Basis of the report

1. With regard to the elements of the international application:*
- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the claims, pages , as originally filed,
 pages , as amended (together with any statement) under Article 19,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the sequence listing part of the description:
 pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of
2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-14	YES
	Claims	NO
Inventive step (IS)	Claims 1-14	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-14	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The closest cited documents are: **D1: EP 237259**
D2: US 5939718
D3: US 3473020

D1 (for example in fig 5) discloses a mass spectrometer having ion source 11, first electrode (lens 16), second electrode in electrostatic sector 74, bent quadrupole 36 and linear quadrupole 26. The main differences between this citation and the mass spectrometer claimed are:

1. The bent quadrupole electrodes 36 are not stated to be fringe electrodes, and would not act as fringe electrodes because of an apertured plate between 36 and 26.
2. The bent quadrupole 36 and linear quadrupole 26 are located in *different* vacuum regions (see fig 2, which has like reference numerals to fig 5).
3. As a result of them being located in different vacuum regions, the linear quadrupole would not receive ions *directly* from the bent quadrupole.
4. The bent quadrupole electrodes are not stated to shield the linear quadrupole entrance.

D2 discloses a mass spectroscopic apparatus having bent ion beam guide 112 (figs 11, 12) which can be quadrupole (col 10 line 17), and linear quadrupole analyser 52. The claims are distinguished from this citation by similar differences as those for **D1**.

D3 shows a quadrupole mass filter having a curvilinear entrance section 28 and a rectilinear section 30, both in vacuum housing 40. Main differences from the present claims are:

1. The curvilinear electrodes are not stated to be fringe electrodes
2. No details are given of an ion optics system including first and second electrodes for diverting a beam of ions to separate neutral ions and photons.

Therefore the claims are novel and inventive and meet the requirements of Article 33(2)-(4).